

Epitomes

Important Advances in Clinical Medicine

Occupational Medicine

The Scientific Board of the California Medical Association presents the following inventory of items of progress in occupational medicine. Each item, in the judgment of a panel of knowledgeable physicians, has recently become reasonably firmly established both as to scientific fact and important clinical significance. The items are presented in simple epitome and an authoritative reference, both to the item itself and to the subject as a whole, is generally given for those who may be unfamiliar with a particular item. The purpose is to assist busy practitioners, students, research workers, or scholars to stay abreast of these items of progress in occupational medicine that have recently achieved a substantial degree of authoritative acceptance, whether in their own field of special interest or another.

The items of progress listed below were selected by the Advisory Panel to the Section on Occupational Medicine of the California Medical Association, and the summaries were prepared under its direction.

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Electromagnetic Field Exposure and Risks of Cancer in Children

ALTHOUGH SIGNIFICANT strides have been made in the past two decades in the treatment of and survival from a few cancers of childhood, cancer remains the second leading cause of death in children younger than 15 years. Thus, interest in the etiology of childhood cancers, and particularly in potentially preventable exposures that might be associated with these cancers, has also grown.

One area of increasing investigation relating to environmental exposures associated with the risk of childhood cancer is that of electromagnetic fields—that is, the magnetic fields generated by flowing electric currents. One of the earliest studies, published in 1979, found an association of high-current-flow electrical wiring configurations near the homes of children in Colorado with about a twofold increased risk of childhood cancer deaths (all types grouped) compared with matched controls. A report from Rhode Island, however, indicated no such excess risk for childhood leukemia. In another study from Colorado in 1988, an excess of in-home wire configuration codes indicating high magnetic field (>2 milligauss) was associated with all childhood cancer and a number of specific types of cancer compared with that in control children. In addition, a study from Texas found a greater frequency of paternal occupations (electronics workers) involving exposure to electromagnetic fields among children who had died of neuroblastoma than among randomly selected, live-birth controls. A 1986 Swedish publication also showed increased magnetic fields (>0.3 microtesla) around the dwellings of children with tumors compared with those of matched control children.

Scientific investigations into any increased risk of childhood cancer associated with either parental occupational exposures or home exposure to high-current electromagnetic fields have been plagued by a variety of methodologic limitations. These particularly include inadequate or biased methods of exposure assessment due to occupational groupings that are too broad; exposure information missing for large proportions of the study population; a lack of uniformity across studies in the timing of the exposure of interest—that is, at birth of the child, at the time of the diagnosis of cancer in the child, or at the time of the study; and a dependence on parental (especially maternal) recall of paternal occupations or occupational exposures. In addition, the inconsistency of findings may be due to a variation in the

nature of the cases included. Some studies have selected newly diagnosed cases, but many studies have identified cases from death certificates, even though most of the cancers in question are not uniformly fatal. In addition, some studies have examined all cancers together, while others have examined specific types, such as leukemia, brain tumors, or neuroblastoma.

An assessment of our current understanding of the effects of environmental exposures on the risk of childhood cancer with these methodologic concerns leads to a conclusion that paternal occupational exposure to high-current electromagnetic fields may increase the risk and is of interest due to the ubiquity of this exposure and suggestions in studies of animals of the potential for a cancer-promoting effect. Further well-designed studies, however, with adequate sample size and exposure assessment and including only incident cases of specific types of cancer are needed.

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Isocyanates, Polyurethane Paints, and Asthma

THE ISOCYANATES are important industrial chemicals used to make polyurethane plastics, which are common materials in our society. The cushioning for automobile seats and office and home furniture is usually polyurethane. Car bumpers are sometimes made of polyurethane. Polyurethane paints and coatings have found wide application in this country's economy because of their luster and resistance to weathering. All polyurethane paints contain diisocyanates or polyisocyanates, which are highly reactive low-molecular-weight compounds. The diisocyanate that previously was most commonly present in polyurethane products, toluene diisocyanate (TDI), has been the subject of extensive study in both laboratory and field studies.

The major adverse health effect associated with an occupational exposure to TDI is the induction of asthma. Al-